

**Commonwealth of Kentucky  
Division for Air Quality**

***PERMIT STATEMENT OF BASIS***

TITLE V PROPOSED PERMIT No. V-99-010 (REVISION 2)  
SUN CHEMICAL CORPORATION, WURLAND FACILITY  
WURLAND, KY.

11/07/03

WHITNEY HARRISON AND CAROLINA ALONSO, REVIEWERS

PLANT I.D. # 21-089-00032

APPLICATION LOG # 55749, 55349 & 53161

**SOURCE DESCRIPTION:**

Sun Chemical Corporation, Wurland Facility operates an existing facility to manufacture pigment feedstock under permit number V-99-010. Urea, Phthalic Anhydride and Cuprous Chloride are reacted in a solvent in six batch reactors. After the reaction cycle is completed, material is decanted, washed, filter pressed and dried.

Ammonia is produced as a byproduct of the reaction. Reaction solvent is lost during the drying process. A condenser and carbon bed adsorber are used to recover solvent. Ammonia and solvent emissions are controlled by a low NO<sub>x</sub> afterburner system (Noxidizer).

**COMMENTS WITH V-99-010 (REVISION 1):**

Application for a significant revision to permit number V-99-010 was received on July 14, 2000 and determined to be complete on December 5, 2000. This application was assigned log number F769 / 51548.

Sun Chemical Corporation, Wurland Facility has applied to increase its annual production limit on Copper Phthalocyanine Crude Blue and to make administrative editorial changes to clarify that the two fabric filters on the Urea Bulk Handling System are two distinct emission points, and to clarify the numbering system used for the KyEIS ID No. and the SUN CHEMICAL CORPORATION, WURLAND FACILITY Vent ID No.

**COMMENTS WITH V-99-010 (REVISION 2):**

Application for a significant revision to permit number V-99-010 was received on May 13, 2003 and determined to be complete on July 1, 2003. This application was assigned log number 55749. Sun Chemical Corporation, Wurland Facility applied to increase its annual production limit on Copper Phthalocyanine Crude Blue.

Two applications for minor revisions to permit number V-99-010 were received. Sun Chemical Corporation, Wurland Facility applied to add a Tank (T-200) as an insignificant activity to Section C of the permit on September 5, 2000 (application log number 53161). On November 22, 2002 Sun Chemical Corporation applied to use this Tank (T-200) for solvent cuts to aid in the production process (application log number 55349).

Applications with log number 51361 and 55349 were combined with log number 55749 on July 3, 2003.

#### EMISSION AND OPERATING CAPS CHANGES WITH V-99-010 (REVISION 1):

The annual production limit on Copper Phthalocyanine Crude Blue included under emission point (3) Production is being raised from 6600 tpy to 8000 tpy. All emissions limitations and monitoring, recordkeeping, and reporting requirements are to remain the same. Sun Chemical Corporation, Wurtland Facility does not have the potential to exceed the PSD major source thresholds.

#### EMISSION AND OPERATING CAPS CHANGES WITH V-99-010 (REVISION 2):

The annual production limit on Copper Phthalocyanine Crude Blue included under emission point (3) Production is being raised from 8000 tpy to 11000 tpy. All emissions limitations and monitoring, recordkeeping, and reporting requirements are to remain the same. Sun Chemical Corporation, Wurtland Facility does not have the potential to exceed the PSD major source thresholds.

#### RISK ASSESSMENT WITH V-99-010 (REVISION 1):

EPA's SCREEN3 model was run for PCBs and Dioxin potential emissions from Sun Chemical Corporation, Wurtland Facility's 150 foot stack. The preliminary remediation goal concentrations (PRGs) from the Region 9 website for these pollutants are as follows:

Dioxin (2,3,7,8-TCDD)	4.5E-08 $\mu\text{g}/\text{m}^3$
Polychlorinated biphenyls (PCBs)	3.4E-03 $\mu\text{g}/\text{m}^3$

The division uses these concentrations to trigger further investigation if it is warranted. The above PRGs are chemical concentrations that represent a  $10^{-6}$  cancer risk. Currently, the division looks at all carcinogenic pollutants not already regulated.

The maximum annual concentration for dioxin and PCBs was determined using SCREEN3 and a conversion factor. For dioxin, the concentration was close to the PRG. For that reason EPA's ISC model was run and the following maximum annual concentrations were determined:

Dioxin (2,3,7,8-TCDD)	3.05E-08 $\mu\text{g}/\text{m}^3$
Polychlorinated biphenyls (PCBs)	2.04E-04 $\mu\text{g}/\text{m}^3$

The Division of Environmental Services provided the Division for Air Quality with the following ambient air concentration values:

Dioxin (2,3,7,8-TCDD)	2.8E-08 $\mu\text{g}/\text{m}^3$
Polychlorinated biphenyls (PCBs)	2.1E-03 $\mu\text{g}/\text{m}^3$

These concentrations were calculated using the default exposure assumptions endorsed by the KYDEP which include the adolescent in the exposure equation and will be used in lieu of the PRGs from the Region 9 website.

The modeled maximum annual concentration for PCBs is less than 10 % of the accepted ambient air concentration value. Therefore, even if 90 % of PCBs exposure is by indirect effects it will still be an acceptable risk.

The carcinogenic risk is calculated by dividing the media concentration ( $3.05\text{E-}08 \mu\text{g}/\text{m}^3$ ) by the target concentration ( $2.8\text{E-}08 \mu\text{g}/\text{m}^3$ ) and multiplying by the risk ( $1\text{E-}06$ ) on which the target concentration was based. This results in a carcinogenic risk of  $1.09\text{E-}06$ . The U.S. EPA (1994 a, b, and c) has estimated exposure due to inhalation of dioxins in a rural setting from an incinerator to be 39% of total exposure. If indirect effects are considered the maximum carcinogenic risk is as follows:

$$\text{Maximum Carcinogenic Risk} = (1.09\text{E-}06) \times (1/0.39) = 2.8\text{E-}06.$$

Due to the conservative nature of the modeling and the risk calculations, it doesn't appear that further evaluation is necessary. This is not sufficient evidence that a problem exists.

#### RISK ASSESSMENT WITH V-99-010 (REVISION 2):

The increase in the annual production limit of Copper Phthalocyanine Crude Blue did not cause the Dioxin or PCB emissions to increase. Therefore, modeling was not conducted during this revision.

#### References

United States Environmental Protection Agency (U.S. EPA). 1994a. Estimating Exposure to Dioxin-Like Compounds, Volume I: Executive Summary. (Draft). Office of Research and Development. Washington D.C. EPA/600/6-88/005Ca.

United States Environmental Protection Agency (U.S. EPA). 1994b. Estimating Exposure to Dioxin-Like Compounds, Volume II: Properties, Sources, Occurrence, and Background Exposures. (Draft). Office of Research and Development. Washington D.C. EPA/600/6-88/005Cb.

United States Environmental Protection Agency (U.S. EPA). 1994c. Estimating Exposure to Dioxin-Like Compounds, Volume III: Site Specific Assessment Procedures. (Draft). Office of Research and Development. Washington D.C. EPA/600/6-88/005Cc.

#### COMMENTS WITH INITIAL ISSUANCE OF V-99-010:

Permit number V-99-010 was originally issued on September 30, 1999 based on the original Title V application (log number F800). Tom Adams was the reviewer of the initial Title V application that was determined to be complete on December 23, 1998.

*Applicable Regulations:* The source is major for Title V (1,2,4-Trichlorobenzene) and a synthetic minor for SO<sub>2</sub> emission and minor for all other pollutants for 401 KAR 51:017 (PSD) purposes.

The source is subject to:

1. Regulation 401 KAR 59:015 New indirect heat exchangers
2. 40 CFR 60 Subpart Dc as adopted by Regulation 401 KAR 60:043; Standards of performance for small industrial-commercial-institutional steam generating units.
3. Regulation 401 KAR 59:010 New process operations
4. Regulation 401 KAR 63:021 Existing sources emitting toxic air pollutants.

*Emission Factors:* Emission factors for small combustion device and material handling equipment are based on AP-42. Emissions factors from the fugitive sources and Noxidizer are based on compliance testing.

*Compliance Periods:* HAP/VOC compliance is based on an averaging period of three hours.

#### EMISSION AND OPERATING CAPS DESCRIPTION WITH INITIAL ISSUANCE OF V-99-010:

The Division has determined that the source does not have the potential to exceed the PSD major source thresholds. This was an issue of public concern and comment when the original construction permit was issued. In response to public comments and a public hearing, several

production “limitations” were included in the construction permit that were brought forward into the Title V permit.

Sun Chemical Corporation, Wurtland Facility is a PSD minor source because of potential emission from the combustion of fuel oil in the burner systems. The source is not currently burning fuel oil.

#### PERIODIC MONITORING:

##### PM/PM10

For small fabric filters for process units, monitoring is to consist of a weekly check and log of pressure drops. For the large pulsejet that controls the dryers, blenders and production equipment, continuous monitoring is done on the inlet temperature and pressure drop across the baghouse. In addition, there is a “break through” monitor on the baghouse that indicates bag failure.

##### NO<sub>x</sub>

There are no add-on controls for NO<sub>x</sub>, but the Noxidizer is monitored to assure destruction of Ammonia and that excessive NO<sub>x</sub> is not being formed. For this the first stage combustion temperature and O<sub>2</sub> outlet concentration are monitored.

##### HAPs (1,2,4-Trichlorobenzene and PCB)

The Noxidizer and carbon bed adsorber controls process Trichlorobenzene emissions. The following are monitored: the inlet and outlet temperatures of the adsorption system, pressures drop across the carbon adsorption system, first stage combustion temperature of the ammonia thermal oxidation system, O<sub>2</sub> outlet concentration of the ammonia thermal oxidation system and HCl outlet concentration of the ammonia thermal oxidation system.

##### Dioxin

Dioxin is formed as a by-product of combustion. To minimize formation, combustion temperature and HCl outlet concentration of the ammonia thermal oxidation system is being monitored. The source will also be subject to periodic testing.

#### CREDIBLE EVIDENCE:

This permit contains provisions, which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

#### PUBLIC NOTICE AND COMMENTS WITH INITIAL ISSUANCE OF V-99-010:

Public Notice for the initial issuance of permit number V-99-010 appeared on July 29, 1999 in the *Greenup County News*. No comments were received on the draft of permit number V-99-010. The divisions issued permit number V-99-010 with some minor changes. The temperature range for the parametric monitoring was changed from Centigrade to Fahrenheit and rounded up. A delay in implementation of the new monitoring and record keeping required by this permit was added.

PUBLIC NOTICE AND COMMENTS WITH V-99-010 (REVISION 1):

Public Notice for the issuance of permit number V-99-010 (Revision 1) appeared on February 1, 2001 in the ***Greenup County News***. No comments were received on the draft of the permit. Therefore, there are no changes to the draft permit.

PUBLIC NOTICE AND COMMENTS WITH V-99-010 (REVISION 2)

Public Notice for the issuance of permit number V-99-010 (Revision 2) appeared on September 25, 2003 in the ***Greenup County News***. The public comment period expired 30 days from the date of publication and no comments were received on the draft of the permit. Therefore, there are no changes to the draft permit.